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DEMOGRAPHIC ASPECTS OF THE DEVELOPMENT OF HUMAN CAPITAL IN RUSSIA AND ITS REGIONS[1]

In the present paper, the contemporary demographic situation that has developed in Russia — which can be described in terms of a demographic crisis — is analysed. One of its most salient characteristics consists in the negative qualitative changes that are occurring in the population, many of them due to the consequences of modern information technology. The negative qualitative changes in the population, which essentially began during the second half of the 1980s and have increased in present-day Russia, prevent the development of human capital in the country. This being the case, the authors give their own interpretation of the concept of "human capital". The purpose of the work is to justify the primacy of the demographic factor in the formation and development of human capital. Migration in the form of a brain drain also has a negative impact on the development of human capital in Russia and its regions. Confirmation of the above-mentioned thesis is provided in a human development index, calculated for the country as a whole and for its regions. In the work, the methods of demographic analysis, the demographic indicators and indexes, which can be used to analyse the qualitative characteristics of the population, are used. The authors arrive at the conclusion that it is impossible at the present stage to develop human capital without first solving the demographic problems. This is especially true for some regions of Russia.

A greater awareness of this will contribute to a more efficient management of demographic processes, which will, in turn, guarantee the positive development of human capital, strengthening and developing the Russian economy and society as a whole.

Keywords: demographic development, demographic crisis, human capital, migration, brain drain, demographic processes management, regional indexes of quality of the population, regional human development index

Introduction

The world today, especially in its more economically developed zones, is undergoing a transition towards a new phase of social development, one in which economic relations are largely determined by the qualitative characteristics of the population. By the middle of the 1990s, 64% of global wealth was represented by human capital, 21% by physical capital and only 15% by natural resources. This general picture contrasts sharply with the 1890s, when the relationship was the other way around. In countries such as the USA, China, Germany and the United Kingdom, the share of human resources presently accounts for about 75-80% of the national wealth, while in Russia it is only around 50% [1, p. 241].

Under these conditions, demographic aspects of the development and functioning of the human capital become of particular importance. At the same time, by the term "human capital" we refer not only to the body of knowledge of educational and professional characteristics possessed by the general population (overall human capital), as well as by each person individually (individual human capital), but also its inherent spiritual, psychophysical and demographic qualities. Without improvement of the latter, the development of human capital is inconceivable. Likewise, it is perhaps not quite appropriate to consider children in terms of an object that fulfils the needs of their parents, along with cars, expensive clothes or other items of movable property. This value is reflected in the economic development of the founders of a theory of human capital of Nobel laureates, T. Schultz [2] and G. Becker [3, 4].

Reproduction of human capital is inextricably connected to the reproduction of the population and its size. According to the English demographer, J. Coleman: "overall population decline may start

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after about 2020 and the population of nominal working age may decline even before that". Thus, in a number of European countries "migration is the dominant or only factor of population growth" [5, p. 19]. Recent statistics have shown that the predictive estimates of D. Coleman are close to the truth, notwithstanding the fact that, during the same years, the birth rate increased slightly in a number of developed European countries. The developed countries have attempted to solve the situation, on the one hand, by greater efficiency in the use of their own human capital, improving productivity, developing new technologies that require less manpower and experts, and so on, and, on the other hand, by attracting migrants from other countries.

The eminent demographer Paul Demeny drew his attention to this problem, highlighting the issue that "of course, massive immigration could become a solution to this problem in the long term, the driving force behind the demand for labour as well as the desire of residents of poor countries to improve their financial situation by migrating to countries experiencing a demographic crisis but having a high level of material wealth"[6, pp. 12-13].

At the same time, in many western countries, it is consistently held that modern societies can limit themselves to the amount of the population that they have at the moment. This position especially takes into account the thesis of overpopulation of the world in the near future and places its focus on the rather more robust population growth in developing countries.

In our opinion, the formation and development of modern society is impossible without positive demographic development, including both population growth and improvement in the reproductive quality of the population. It is no accident that the forecasts of some specialists predict that countries having larger populations will tend to become more competitive and economically developed in the future. For example, due to its large population, China has turned into the "workshop of the world", the United States compared to the European Union countries. The role of demographic factors is of particular significance for Russia, which is experiencing an even more sharply negative demographic situation than the situation in more developed countries. At the same time, in the global hierarchy of the most populated countries in the world, Russia has been steadily declining. Accordingly, Russia 4.1% share of the world population in 1950 dropped to 2.0% in 2014[2] and is projected to fall to around 1.2% by 2050[3].

Taking into account Russia's vast territory (more than 17 million km2), the quantitative factor of the total population remains critical, a factor that is particularly relevant at its present stage (from the 1990s onwards). During these years, in relation to the demographic situation in Russia, the concept of "demographic crisis" came to be seen as the primary factor preventing the development of human capital in Russia and across its regions.

In his treatise "On the Preservation and Reproduction of the Russian People, Mikhail Lomonosov wrote that the size of the population is of great significance for Russia and that it was precisely in this that he saw "the glories, power and wealth of the entire state, not in the futile unpopulated vastness." In speaking about the need to increase the population of Russia, he underlined that, however, the point must be about "strong and healthy population" [...] "a judicious attraction of immigrants" [7, p. 131, 144]. In the 250 years since then, the relevance of the issue of the preservation of the Russian population, the promotion of the health of the population and improvement of the qualitative characteristics has increased even more. This is especially relevant for the regions such as the Far East, Siberia, Urals and Northwestern Federal District, which continue to lose population, not only as a result of the natural population loss, but also as a result of migration outflow. In general, it should be emphasised that, when speaking about Russia, one must keep in mind the large regional differences in terms of demographics.

Negative trends in the demographic development of Russia emerged at the end of the 1960s. However, in some regions of the country, the "lack of the population" negatively impacted their development even sooner. Thus, in the Pskov region, a natural population decline was already being observed from the mid-1960s. During this period, it was necessary to take measures for a fundamental reorganisation of the health system and the social sphere of the country: to invest considerable funds to control cardiovascular and oncological diseases, to take the necessary measures to further reduce infant mortality and to develop a more solicitous attitude towards health and human life generally.

[2] World Economic Outlook (April 2015) — Washington, IMF, 2015.

[3] World Population Prospects 2004. New York: United Nations, 2005.

However, the former Soviet Union, which became a hostage of its own ideology, could not make these steps due to lack of necessary funds. The hope that demographic problems would resolve themselves in the socialist society, with the Socialist Commonwealth needing only to contribute more to the military, proved to be illusory. At the same time, Russia was also an internal donor, being the only of the former Soviet republics to pay into the Union budget without receiving anything back. It has only reinforced the prospects for its further demographic development, which negative trends, in turn, increasingly impeded the progressive economic development of the country. First of all, it affected the Non-Black Earth regions, where, in the late-1960s, there was a significant migration outflow, which, along with a declining natural increase, led to the depopulation of the regions and the rapid aging of their populations. Since 1992, these negative trends have increased still further.

Statistical data and methods

The statistical base of the research consisted of the official sources of data on economic, social and demographic indicators of the Federal State Statistics Service (Rosstat): Russian census data for 2002 and 2010, Statistical Yearbook, Demographic Yearbook of Russia (Rosstat), Statistical Bulletins of Rosstat "Vital Statistics of the Russian Federation", "Population Size and Migration in the Russian Federation" and a number of other sources of the Federal State Statistics Service over the last 20 years, including "The Reproductive Health of the Russian Population in 2011: Final Report" (Federal State Statistics Service, United Nations Population Fund, etc. Moscow, 2013); "Socio-Economic Indicators of the Russian Federation for 1991-2013 years"; "Regions of Russia. Socio-economic Indicators"; Human Development Reports of UNDP, as well as the World Economic Outlook and the World Population Prospects.

On the basis of these data, using, in particular, the two indexes developed by A. A. Sagradov, the authors managed to obtain the confirmation of the findings, which have been obtained in the course of empirical observations and their analysis: firstly, the intellectual potential development index, based on the five indicators that characterise the following key measuring instruments: average time spent in the education of the employed population (education indicator); coverage in primary, secondary and higher education (indicator of current education, closely related to the education cost); number of PhD students per 100,000 employees (indicator focused on training of scientific manpower); number of employed persons doing research and development per 100,000 employees (indicator of research staff); the share of domestic expenditure for research and development in percentage of the gross regional product (indicator of intensity of research).

The intellectual potential development index (*IPDI*) is calculated by the following formula:

$$IPDI \quad \frac{}{j}\sum \frac{X_{j,fact.}}{X_{j,optim.}} \frac{X_{j,worst}}{X_{j,worst}} \tag{1}$$

where $X_{j,\ fact.}$ is the actual value of the index of j aspect; $X_{j,\ optim.}$ is the optimal value of the index of j aspect; $X_{j,worst.}$ is the worst value of the index of aspect j and j is the number of aspects considered (j = 5) [1, p. 241-246].

Secondly, what is meant here is the population quality index proposed in the mid-1990s and different from the human development index (UNDP, 1990) by including the two demographic indicators characterising fertility and nuptiality. In this connection, each quality characteristic may be expressed both by the system parameters reflecting its various aspects (e.g., health — by means of mortality, physical development, disability, etc.) and by using a generalised indicator. To calculate the population quality index, the following generalised indicators are used: total birth rate (generalised indicator of birth rate), average life expectancy at birth for both sexes (generalised indicator of health), number of men aged 16 years and older (per 1000), the proportion of married population (generalised indicator of marriage), the number of employees (per 1000) with secondary or higher education (generalised indicator of education) and the common logarithm of real per capita (at parity of purchasing power) gross regional product (generalised indicator of professional skill) [1, p. 234-240].

The population quality index (*PQI*) is calculated by the following formulae:

$$PQI \quad \frac{\sum IQC}{} \tag{2}$$

$$\text{The } IQC_i = 1 - \frac{X_{i,optim.} - X_{i,fact.}}{X_{i,optim.} - X_{i,worst}}, \quad (3)$$

where *PQI* is the population quality index; IQC_i is the index of i qualitative characteristics (*IQC*); *I* is the number of qualitative characteristics ($i = 5$); $X_{i,fact.}$ is the actual value of the generalised indicator of the *i* qualitative characteristics; $X_{i,optim.}$ is the optimal value of the generalised indicator of *i* qualitative characteristics and $X_{i,wors.}$ is the worst value of the generalised indicator of *i* qualitative characteristics.

However, it should be noted that the indexes need to be specified, as was done in the course of the work on the human development index (*HDI*), where, in particular, the economic indicator is calculated by parity of purchasing capacity. Apparently, the more accurate indicator might be life expectancy at birth, if this refers to the expectancy of a healthy life, which in Russia drew attention during the early 2000s, when, according to the indicator, it was at 107th position in the world[4]. It should be noted that the differentiation of this index is significant in the regions. Much the same may be said about the indicator characterising education. What is of importance is not only the number of people with secondary and higher education but also how many of them work in their specialised fields following graduation. According to some estimates, over 50% of graduates do not work in the specialised field for which their university education prepared them. The details are further discussed elsewhere in the paper.

The Demographic Crisis as the Main Factor Preventing the Positive Development of Human Capital in Russia

It was precisely in the 1990s that what we refer to in terms of demographic crisis took place. This was a situation fundamentally different from all previous periods of demographic development of Russia (even from the period of 1941-1945, when the absolute population decline exceeded 13 million people, and was the most significant in the history of the country). It should be noted that other concepts are used for the characteristics of the current demographic situation in Russia: “demographic decline”, “depopulation”, “demographic hole” and “demographic catastrophe”. Some of these concepts are often used as synonyms. However, it should be understood that they reflect different demographic situations: while harmless, at first glance, the substitution of one term by another or their mixing can, in our view, significantly distort the information on the degree of negativity of modern Russia's demographic development and thereby mislead the leadership of the country and regions — as well as society as a whole — impeding an understanding of the extent of the current demographic issues and their critical importance for the future of the country.

Without going into detail on all of these concepts, we select only one of them: the "demographic crisis", which, in fact, determines the present demographic situation in Russia, as well as in many developed countries.

The essence of the demographic crisis is that, along with the quantitative changes (depopulation) and structural factor (most often it comes down to negative changes in the age and sex structure of the population), the negative qualitative changes have begun to increase rapidly. We can therefore say that the structural factor of depopulation is only a part of a wider demographic crisis.

Some of the quantitative changes are described by the following facts: the birth rate decreased significantly and rapidly (the overall birth rate in 2004 was 10.5% as against 14.6% in 1989, with the total fertility rate declining over this period from 2.01 to 1.34 children per woman); as a result of the fertility decline, an increasingly aging population is observed (the over-working-age proportion of the population increased from to 18.5% in 1989 to 20.3% in 2004); in 1999, for the first time, the number of senior citizens exceeded the number of children; mortality increased sharply, especially among the male working population (in 2004, the crude mortality rate was 16.1% against 10.7% in 1989); life expectancy reduced (from 69.5 years to 65 years overall, from 64 years to 58 years for men, from 74.5 years to 72.5 years for women); each year, 450,000 men die prematurely.

The result of these differently directed processes is that the observed increasing natural decline in the population of Russia (by more than 13 million people for the years 1992–2012) had reached nearly a million people annually by the early 2000s. Only growth in migration, which over this period comprised around 7 million people, “smoothed” the general decline of Russia's population to 6.3 million.

[4] Population of Russia in 2001. (2002). The 9th Annual Demographic Report / In: A. G. Vishnevsky (Ed.). Moscow: Book house "Universitet", 216, p. 92-98.

However, migration growth fell off significantly during the 2000s, dropping from 978,000 people in 1994 to reach a minimum value in 2003 of 93,000 (in 2010, it had risen to 158,000; by 2014, it was 280,000).

Despite a slight improvement in the quantitative indicators of fertility and mortality between 2006–2014 (the total fertility rate, for example, increased from 1.3 to 1.7), in Russia, a reduced reproduction rate on the part of the population continued to be observed and the demographic situation remains complex. This is evidenced by the other two main components of the demographic crisis: the negative structural and qualitative changes in the population of Russia, both of which are deteriorating.

Concerning quantitative demographic indicators and their impact on human capital development, we may remark that these consist primarily in the number of children in a family, the intervals between their births, the reproduction of children as a potential human capital, the "quality of children" in the process of formation and development of human capital at the level of a family, which, in particular, are considered in detail by N. V. Zvereva [8, p. 34-38]. Speaking about the development of human capital, we note the special role played by the age-sex structure of the population, taking into account the state of health of different groups of the population and differences in mortality among these groups, as detailed in publications under the editorship of A. A. Sagradova [9].

As regards the structural factors, the strong negative example is the change in the age structure: by the 2000s, the number of the working-age population in Russia had begun to reduce significantly (in recent years, this decline has reached one million people each year; by 2050, it is predicted to decrease by more than 26 million people[5]), which will undoubtedly affect overall human capital both in Russia in general as well as across its regions.

A reduction of the working-age of the population exacerbates the situation of shortages in the labour market, which, in particular, led to a massive labour force intake, including illegal labour (in 2013, the number of international migrants, according to the head of the Federal Migration Service (FMS), K. O. Romodanovsky, exceeded 7 million people). At the same time, when focusing attention on the quantitative indicators of population decline, which took an extreme form of depopulation in Russia, it is necessary to stress that another important characteristic of the demographic crisis has yet to be mentioned, namely the problem of the general degradation (spiritual, mental and physical) of the Russian population. Its qualitative characteristics have significantly deteriorated due to the growth of tobacco smoking, alcoholism (including juvenile beer drinking), the spread of AIDS, hepatitis C and drug addiction, all of which have led to an increase in the aggression and social psychosis of the population (its extent remains to be formalised). In turn, these factors have led to an increase in the number of young people who are incapable of understanding the richness of contemporary knowledge and may additionally be incapable of thinking or even simply unwilling to think. All of this reduces the educational level of young people (the number of illiterate teenagers in the country has been estimated at two million). The even more confusing fact is that a number of those receiving a college-education has increased significantly; however, the number of qualified specialists needed to administrate the economy of the country and its regions continues to decline. Concerning this particular issue, starting from 2008, R. Grinberg, Head of the Institute of Economics of the Russian Academy of Science has remarked on the "de-intellectualisation of labour" and "de-intellectualisation of human potential" that are becoming an "obstacle to the economic development of Russia and its regions." The latter point, in particular, was emphasised at his plenary speech at the Moscow Economic Forum on March 26, 2015. The intellectual potential development index (*IPDI*) may, in particular, serve as an indicator of this "de-intellectualisation".

The *IPDI* calculations for the 77 regions of Russia, conducted by A. Sagradov at the beginning of the 2000s, showed that among the leaders on the index were: Moscow — 0.903; St. Petersburg — 0.816; the Nizhny Novgorod region — 0.605; the Moscow region — 0.605; the Novosibirsk region — 0.542; the Tomsk region — 0.539; the Kaluga region — 0.493; the Ulyanovsk region — 0.467; the Samara region — 0.460; the Voronezh region — 0.445; the Rostov region — 0.429; the Sverdlovsk region — 0.419; the Yaroslavl region — 0.418; the Chelyabinsk region — 0.406; the Saratov region — 0.406; the Penza region — 0.403; the Omsk region — 0.401; these were the places where the number of higher education institutions and research institutes significantly exceeded the number of such institutions in the other regions. The worst results were recorded in the Republic of Khakassia — 0.296; the Chita

[5] Will it be too late after 10 years? Demographic Policy of the Russian Federation. The challenges and scenarios. (2013). Moscow: Institute of Scientific and Social expertise. 98, p. 16.

region — 0.294; Chukotka Autonomous Okrug — 0.265 and the Republic of Ingushetia — 0.250. In all other 58 regions covered by the research, the index ranged from 0.395 in the Vladimir region to 0.302 in the Vologda region [1, p. 243-245].

The calculations of the above-mentioned regions made in 2012 showed that almost the majority of these regions the index was deteriorated. Thus, in Moscow it dropped to 0.898; in St. Petersburg to 0.810; in the Nizhny Novgorod region to 0.598; in the Sverdlovsk region to 0.407; in the Chelyabinsk region to 0.398.

As for outsiders, their results deteriorated even further. However, it should be noted that in a number of regions, this index increased. First of all it concerns the Belgorod region, where it increased from 0.336 to 0.377, in the Republic of Tatarstan from 0.391 to 0.405, in the Tomsk region from 0.539 to 0.553, in the Republic of Mari El from 0.382 to 0.398. However, it must be said that, despite the increase of the index in a number of regions and republics in Russia, the majority of Russian regions, including the above-mentioned, have a relatively low level of intellectual capacity. Moreover, if it is assumed that in the near future it will continue to decline, it can, therefore, be said that the human capital of these regions will undergo further negative changes.

At the same time, it should be stressed that comparison of *IPDI* and per capita gross regional product makes possible to assess how the economy of the regions of Russia is dependent on their human capital.

It is important to note that the economic development of the regions of Russia has a specific character due to the powerful energy production complex (oil, gas, etc.). And, as A. A. Sagradov's calculations showed, in the regions without these resources, but which provide 75.3% of the total gross regional product of Russia, intellectual potential is responsible for 42.8% of the production of per capita gross regional product. This figure is only exceeded by the net effect of capital intensity (the value of fixed assets, based on the number of economically active population) — 47.3%. However, intellectual potential far exceeded the influence of other factors, including factors such as extraction of natural resources, which together amounted to 9.9%. Accordingly, "the further development of Russia's economy based on human capital depends on overcoming the demographic crisis. Here arises the important question of removing the "contradictions between the optimisation parameters of population reproduction (fertility and mortality) taking into account the qualitative changes, on the one hand, and increasing the level and quality of education and qualification — on the other hand [1, p. 245-246].

The critical demographic situation is also characterised by the fact that in recent years more than half of babies are born with serious diseases. Further, no fewer than 5% of them are "on the street", i.e. abandoned by living parents, the total number of orphans consisting of about 700 thousand people, the homeless — more than 4 million people. 7 out of 10 graduates of schools have chronic diseases and three quarters of graduates of higher educational institutions have additional diseases. This greatly contributes to what was written above: the growth of tobacco consumption (in 2005, Russia was rated the 4th worst place in the world for tobacco consumption among adolescents[6]; it continues to lead on this indicator). Alcoholism is increasing (including of children from birth); the number of beer alcoholics up to 14 years already numbers in the hundreds of thousands people. There has been an unprecedented increase in drug addicts. The total number of drug addicts is currently estimated at 6 million; in the coming years, it could exceed up to 10 million people! At the same time, drug addiction among the young is 2.5 times higher than among the adults. The number of deaths from drug use has increased by 12 times compared with the 1980s; among minors, it has increased by 42 times. The average life expectancy of drug addicts is around 10–15 years. Each year, about 1 million people are recognised as disabled; in 2010, the total number of children with disabilities exceeded 550,000 people [10, p. 145]. Besides the fact that all of the above-mentioned places a huge burden for the economy, it is also a great social and demographic problem.

From the demographic point of view, the most serious aspect is the fundamental changes for the worse in the reproductive behaviour and health of the population[7], attitudes to childbirth and parenting and the emergence of individuals who have lost their maternal and paternal instincts.

[6] Gerasimenko N. F., Zaridze D. G., Sakharova G. M. (2007). Health or Tobacco. Facts and Figures. Moscow, p. 80.

[7] Reproductive health of the population of Russia in 2011. Final Report (2013, May). Federal State Statistics Service (Rosstat); The Ministry of Health of the Russian Federation, p. 15.

There is also, in terms of the crisis of the institution of the family, a crisis of social and demographic development of society. In early 2002, for the first time in Russia, the number of divorces exceeded marriages; today, up to 70% of marriages break up in the first 9 years. In recent years, in Russia, the number of victims of family violence amounts to more than 2 million children a year. In fact, as we noted above, were the increase in the degradation of young people and general population to reach a critical mass (more than 50% of the total population), this would put an end to the development of Russia as well as constituting a direct threat to its national security. This is what the famous scientist S. P. Kapitsa, shortly before his death, wrote in the article: "Russia is becoming a country of fools".[8]. This was also echoed in the words used by Patriarch Kirill when speaking at the Third World Congress on the Family, which was held in Moscow on 10-11 September, 2014 under the slogan "Large family and the future of humanity". The Patriarch particularly stressed that "a family without children — is not a family" and that "family is the most important institution, the destruction of which would lead to the death of society".

At the same time I would like to stress once again that, contrary to the opinion of some scholars concerning a plurality of demographic crises, allegedly occurring at different times in Russia[9], the concept of "demographic crisis" became a reality for modern Russia during the rupture of the 80s-90s. This concept embodies the quantitative, structural and qualitative negative changes in the population. Moreover, these changes are already on the genetic level, as was pointed out by V. I. Danilov-Danilyan speaking about the growth of "decay of genetically deformed specimens" in the population, that becomes "an equally dangerous threat to the human race, as well as [leading to] degradation and destruction of environment" [11, p. 474-475]. In turn, environmental degradation leads to a further deterioration in the health of the entire population.

Speaking about the changes at the genetic level, something should also be said about the problem of the impact of modern information technology (especially the Internet) on the minds of young people. In fact, this concerns the information war against Russia and many other countries. [12] A confirmation of this fact can be found in the works of famous Russian philosopher A. A. Zinovyev, in one of which, he wrote that the: '"...bomb of westernisation" exploding in Russia, made the awful devastation not only in the sphere of state, economics, ideology and culture, but also in the very human material of society. On such a scale and at such times, no invaders with any weapon could make it. As it was (intended by its inventors) to defeat communism, the "bomb of westernisation" in its practical application proved to be immensely powerful: it destroyed the mighty centuries-old association of people". [14. p. 11-12]. Certainly, it is hard to agree with the statement that such destruction has already occurred; however, the fact that modern information technologies destroy our human capital is becoming an indisputable fact; the leaders of the country and its regions have to pay close attention to this.

Returning to the concept of crisis, it is important to point out that the demographic crisis originated not in Russia but in Germany during the late 60s to early 70s of the last century, subsequently spreading to other developed countries. Exactly these changes in the demographic development are reflected in the concept of the second demographic transition [15, p. 848], whose essence lies in the fact that in the place of a bourgeois family came a so-called individualistic family, whose reproductive attitudes dramatically changed for the worse. Among couples, the proportion of families that deliberately refuse to have children has begun to increase. According to Reiner Klingholz, the head of the Berlin Institute for Population and Development, in Germany, the share of such families was about 15%, in 2012 [16, p. 8]. It is difficult to say how many of such families there are in other developed countries; as far as we know, specialised large-scale surveys on this topic have not yet been carried out. On the basis of a series of assessments, it can be assumed that this proportion is smaller than in Germany. An indirect confirmation of an increase in the proportion of such families is seen, in particular, in a growing child-free movement, which, unfortunately, in 2006, appeared in Russia and promoted, in fact, the refusal to have children, or "some personal freedom without children". If we add to this phenomenon a sufficiently rapid growth of so-called non-traditional marriages (in 16 European countries, such marriages are legally permitted), then the demographic future of these countries seems deplorable. And the following question arises: whether Russia should follow this way of demographic development,

[8] Sergei Kapitsa: "Russia becoming a country of fools". Available at: http://www.amic.ru/news/175737/

[9] Demographic Encyclopedia. (2013). Moscow: Encyclopedia, p. 944.

which, unfortunately, it has started to follow as it becomes more and more stuck in the quagmire of the demographic crisis.

The last, in particular, is reflected in the negative dynamics of the population quality index (*QPI*). Proposed in 1995 by A. A. Sagradov [17, pp. 60-67], the index on regions of Russia for 1980-2004 years, showed that "the situation in the field of population quality differs with high tensions and contradictions... The contradiction of the situation in the field of population quality is observed in the absence of co-ordination of optimiation processes of various quality characteristics, which reduce the value of the regional indexes of population quality" [1, p. 236]. At the same time, it should observed that in 2000-2004, the most significant decline in the population quality index took place in the following regions: Moscow, Ingush Republic, Kabardino-Balkar Republic, the Murmansk region and the Kaliningrad regions. In this connection, it is interesting to emphasize that Moscow, which constantly tops the ranking of the Human Development Index (HDI for 2010 was rated 0.931, while the HDI in the Belgorod region standing on the 5th position was only 0.866; in the Sverdlovsk region (12th position) — 0.842, in Khabarovsk Territory (39th position) — 0.816, in Altai Territory (56th position) — 0.805, in the Republic of Ingushetia (71th position) — 0.790, in Republic of Tuva (the last 80th position) — 0.750), Moscow, as well as a number of others stand in the top ten regions in HDI, according to the quality population index was only in the middle of the regional ranking due to the very low indicators of fertility and marriage. This discrepancy is explained by the fact that the human development index does not take into account, as we have noted above, indicators of fertility and marriage. At the same time, speaking about the population quality index, it should be stressed that it is not perfect because it does not fully take into account the negative qualitative changes that occur in the population of Russia. For example, speaking of health, and based on an integrated indicator of expected life expectancy, it is necessary to make corrections, as was mentioned above, according to an indicator of expected health life expectancy. Indicators related to the education, particularly higher education, require a significant amendment since the increased number of college-educated does not entirely correspond with the quality of the graduates. This is particularly evident in remoter regions of Russia.

Migration and Human Capital

An equally important component of human capital development in Russia and its regions is the migration of the population, which in terms of global development acts as an engine of technological progress, the most important factor in the development of humanity as a whole.

An American researcher, L. A. Sjaastad, was one of the first to propose in 1962 a detailed theoretical basis for the migration of individuals due to expectations of improving economic conditions as the result of migration. In particular, he suggested that individuals or households migrate in order to increase their human capital, i.e. the increasing ability to earn income during their lives as a result of the decision to relocate to another region or another country. In other words, an individual moves if he thinks that the benefits from migration will exceed its costs.

However, since the benefits of migration do not reveal themselves immediately but appear after a certain period of time, it may be said that migration is an investment. In this sense, migration is an action whose costs become manifested at once. These costs are balanced by the future income expected from the investment. "As it is an investment aimed at increasing the human potential — wrote Sjaastad — we refer it to an investment in a human capital, i.e. investment in the increasing of the productivity of human resources" [18, p. 83]. Microeconomic models that use this provision became related to models of human capital.

There are a number of distinct features in the approach taken by the theory of human capital, which, in our opinion, have advantages over the other theoretical approaches in terms of ability to explain migration behaviour. Firstly, the human capital model clearly shows that the benefits of migration are seen only for a certain period of time; this is part of the explanation of the fact that the migration rate decreases as the age of an individual increases. At the same time, a person may migrate even if the increase of income from migration is not expected any time soon. Secondly, the theory of human capital is not limited only by the economic benefits and costs of migration. Indeed, while many economic studies narrowly focused on monetary factors, the costs and benefits of migration can be measured by many non-financial indicators. For example, the "psychological costs", the loss of communication with friends and family, the costs of communicating with relatives who are left at home or the loss of access to some attractive local facilities. On the other hand, the advantages

in this category may include the improvement of factors such as climate and availability of cultural facilities, closeness to friends and family living in a new place, or access to the public goods of a higher quality. Thus, many factors, both tangible and intangible, can accumulatively influence the quality characteristics of a man and his life as a result of migration.

The basic model of human capital provides a simple evaluation criterion: the current value or net benefit of the moving from a point "I" to point "j" is a function of the difference between the origin point and destination less the costs of moving, taking into account the correction factor, which consists in a method that allows it to be taken into account that a person is less positively inclined towards future events compared to the same events taking place in the present. It should be noted, however, that although the model allows different ways of measuring the costs and benefits to be used, it definitely involves a decision-making process at the level of individual households [19, p. 124-125].

At the same time, speaking of migration, it should be noted that it can have both positive and negative consequences, especially concerning the phenomenon of "brain drain". While this term appeared in the early 60s of the last century, the phenomenon was already in evidence at the time of Peter the Great, who was the first to pursue a policy of attracting foreign experts. By this term, we mean the "irrevocable migration of highly skilled professionals including potential professionals in order to attract whom the destination countries conduct a deliberate policy."

Among the millions of migrants (in the 2000s, their number exceeded one billion people each year) [20, p. 139] the migration of scientists, postgraduate researchers, engineers, doctors, professors, students and other highly qualified individuals has a special status. In this connection, the proportion of intellectual migration in comparison to general migratory flows is constantly increasing: according to some estimates, it has exceeded 30%. As noted in the report of the former Secretary-General of the United Nations, which Kofi Annan delivered on April 3, 2006, entitled "International migration and development", the share of skilled immigrants in the 2000s became more significant compared to the 1990s, reflecting the growing trend: "The countries of migration destination are increasingly using their programmes in the field of permanent immigration as a means of attracting skilled migrants"[10].

As for Russia, since 1987, annual emigration from the country has increased dramatically, more than doubling compared to the previous year. If in 1985 the number of people moving abroad to take up permanent residence was 2,900, then in 1990 it was 103,600 people (respectively, for the USSR as a whole, 6,100 and 452,300 people). The total number of people leaving Russia from 1987 to 1992 was about 373,000; from 1993 to 2005 it was 1.05 million people, and from 2006 to 2014 — 1.1 million people. Therefore, the total number of people emigrating from Russia between 1987 and 2014 exceeded 2.4 million people.

However, along with general emigration, the outflow of highly qualified specialists has grown even more dramatically: their share increased from 14% in 1992 to 31% in 1999 and to 47% in 2012. The number of employees working in science and academic emigrating from Russia over this period exceeded 42,000 people. In this connection, attention is drawn to an increasing number of PhDs and Doctors of Sciences among them. So, if in 2003 there were 63 people, in 2012 their number had reached 234 people. How many of these had left on invitations to a more or less long-term period but having a desire later to change their status to a permanent residential status is not able to be determined. However, the following is known: for many of them, the most talented in mathematics, programming, nuclear physics, biology, genetics, etc. a deliberate policy of luring them away for a permanent employment in the of destination country was being executed. And in this case, it is possible to talk about the brain drain, even if, initially, it was a temporary migration, as in the case of migration of students and PhD students. According to the official data of OECD member states, in 2006, there were around 35,000 students from Russia. Over the last 6 years, this figure, according to Rosstat, rose by 30%. However, along with the trend of an increasing number of overseas students, there is a tendency towards growth in the number of those who do not return after graduation. Thus, according to the estimates, the number of those who did not return after studies abroad in the Novosibirsk region in 2001-2005 was 70% [21, p. 80]. A rather distressing tendency is observed in Moscow, where already up to 10% of the students from a number of leading universities including Lomonosov Moscow State University do not return home after completing their studies abroad. What is also worrying is the fact that, among students, the number of potential immigrants is growing, i.e., it is expressed in various

[10] World population monitoring, focusing on international migration and development. (2006). Report of the Secretary-General. The Commission on Population and Development. Thirty-ninth session. 3-7 April, 2006. New York, United Nations, p. 9.

interviews expressing the desire to emigrate abroad (up 37%) or in concrete steps aimed at exiting the country [22, p. 142].

It must be emphasised that it is not only the residents of Moscow and St. Petersburg but also people drawn from many other cities and regions of Russia who are increasingly involved in the orbit of Russian emigration. So, if in 1992 40% of all emigrants, including students and PhD students were drawn from these two cities, then in 1999, these two cities were only responsible for 11%. With regard to regional specifics of the outflow of specialists from Russia, in addition to the regions mentioned above, one can mention Nizhniy Novgorod and the regions of Sverdlovsk, Irkutsk and Tatarstan. Even if the multimillion Russian emigration predicted in the 90s by many scientists and politicians fortunately did not take place, what cannot be doubted is the constant interest on the part of Western countries to attract the best Russian minds. This is the essence of current losses for Russia, which only in material terms is estimated at hundreds of billions of dollars and which has become a direct threat to the preservation of Russia's human capital.

In terms of the purposeful deprivation of Russia (and other less developed countries) of its most valuable asset, i.e. its human capital, this inevitably leads to an economic lag. We may ask whether it is possible to measure in money the human capital in the widest sense of the term, whether it is possible to give an economic assessment of the intellectual and spiritual wealth of the population, the loss of which leads to its degradation and self-destruction? How figuratively said in the 18th century the famous scientist, B. Pascal it may happen that "it will be enough for 300 intellectuals to leave and France will become a country of idiots" [22, p. 85]. How many minds need to emigrate from Russia for the same to be true — 3,000 or 3 million, is apparently unknown. How is it possible to estimate the losses to Russia, for example, from the emigration to the United States of M. Lukin, one of the Russian physicists who participated in the development of "stopped light", which in the near future may help, in particular, in the creation of a quantum computer that will differ from a modern laptop as current computers are different from the abacus. As J. Alferov, the Nobel laureate of 2000, the first and only Russian scientist who became a foreign Member of the Academy of Sciences of the United States and the National Academy of Engineering Sciences, said: "Russia cannot be a rich and strategically independent country without a revival in electronics, without bringing it to a whole new level corresponding to the twenty-first century".

Who will revive not only the electronic sciences but also science and industry as a whole? Can we, like 50-70 years ago, rehabilitate the present intellectual losses? When the national education system is being collapsed, when at least 49% of the scientists have passed the age of 50 years and a new replenishment (from September 1, 2014, the post-graduate course was turned into a 3d stage of higher education, when the defence of a PhD thesis is not so much important anymore) is clearly not enough, when there won't be enough time to recover in view of the extremely rapid changes, which in the age of the information revolution take place in science and technology? While there is a need to consider a radically new aspect, which consists in the fact that if the earlier number of specialists leaving is fairly quickly offset by training new specialists in the country, in a demographic crisis, this compensation becomes unlikely.

The tragedy of today lies in the fact that the consequences of this phenomenon in the past and the present are absolutely incomparable when the future is defined by high technologies. Without underestimating the tragedy of the emigration of the 1920s, the current brain drain in its scope and negative effects is significantly more harmful to the human capital development of Russia, a matter that requires close attention not only from the federal government agencies but from the regional authorities and society as a whole.

Conclusion

The demographic crisis observed in modern Russia is one of the most serious threats for the reproduction and development of its human capital. The crisis creates very real tangible risks for Russia, threatening its territorial integrity, making impossible a sustainable economic and social development of the country and its regions in the 21st century. Moreover, in the 21st century, the critical demographic situation in the country has been increasing due to the massive impact of modern information technology (especially the Internet), aimed primarily at young people's minds, that only exacerbates the situation. What kind of human capital can be talked about when referring to the thousands of beer alcoholics under the age of 14 years, an increase in drug abuse among minors, an

increase of genetically determined "abandoned individuals", an increase in the percentage of families who consciously refuse to have children?

Is it possible under these circumstances to improve the demographic situation in Russia, to reverse the negative trends of demographic development? In our opinion, despite the high inertia of demographic processes, it is possible to carry out the task. However, its solution requires an immediate consolidation of the strength of the state and society, the awareness of the leaders of the country and its regions and society in general that a continuation of the negative trends in the current demographic processes is very devastating for Russia; an understanding of the need for immediate decisive actions to increase the birth rate and childrearing (e.g. through recognition on the part of the state and society of women's work to give birth and bring up a child as the main and paid sphere of life), the reduction of mortality (mainly of preventable death), and promoting health through the promotion of healthy lifestyles, improving health and social conditions as well as an active state migration policy of attracting compatriots to Russia. The main thesis should be "better to be mentally and physically healthy, educated and rich than sick, illiterate and poor". In this respect, the first message of the President of the Russian Federation, Vladimir Putin (2000) was encouraging: there, for the first time in this kind of document, the demographic problem was identified as a priority, and there were remarkable words: "Russia, first of all, is people who consider it their home". For Russia, a personal, permanent, presidential control of implementation of the priority issues is particularly significant and necessary. Unfortunately, in the last message of the President, this important problem was almost completely ignored.

Overcoming the demographic crisis in Russia underpinning its further successful development is possible only through an integrated national approach to the management of demographic processes, namely: generating the rise in births or at least stabilising it (at the level of 1.9-2.0 healthy child on a woman); a reduction in mortality (there is a huge potential for reducing exogenous, preventable mortality); the development of a national immigration policy adequate to the current demographic realities (this should be based on an understanding that migration is not an evil against which we must fight using powerful repressive apparatus but is good for Russia); increasing the internal migration mobility of the population; attracting skilled immigrants; and, most importantly, the development of attitudes towards health (both spiritually and physically) and prosperous human life as the most important values of the state. This is a key for the formation and development of human capital, without which a successful future for Russia and its regions would be impossible.

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